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No. 2775.

IN THE
United States
Circuit Court of Appeals
FOR THE NINTH CIRCUIT.

Joseph E. Ward,

Appellant,

vs.

Rogers Brothers Company,

Appellee.

APPELLANT'S BRIEF.

FREDERICK S. LYON,

Solicitor for Appellant.

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APPELLANT'S BRIEF.

This is an appeal from the decree of the District Court of the United States for the Southern District of California, Southern Division, dismissing appellant's bill of complaint charging infringement of letters patent No. 991,043, dated May 2, 1911, for process of making roadways.

The trial court did not file any opinion. The case was tried in open court, and at the conclusion, after hearing the argument of counsel, the bill of complaint was dismissed on the ground of non-infringement.

The assignments of error appear on page 63 of the Transcript.

The patent in suit appears on pages 54-58 of the Transcript of Record.

As stated in the patent:

“The main object of the present invention is to reduce to a minimum the amount of oil required in making the roadway.”

As shown by the testimony of Mr. Ward [Transcript page 16], prior to the introduction of Mr. Ward's process the specifications for road building throughout California required as high as two and one-fourth gallons of oil to the square yard; since the introduction of Mr. Ward's process the specifications generally throughout California require a gallon or less to the square yard.

The difference in saving due to the Ward process, therefore, is a saving of at least one-half the cost of the oil. The testimony of Mr. Ward is corroborated by the testimony of other witnesses in this regard. As to this fact there is no dispute in this case and the defendant in its use of the infringing process has sometimes reduced the amount of oil applied even as low as one-eighth of a gallon of oil to the square yard [Transcript of Record page 46].

A further object of the Ward invention consists in finely dividing or comminuting the oil and discharging it downwardly under pressure against the surface of the roadway in such manner that as the oil is comminuted or broken up it is surrounded by air so that the particles of oil are suspended in an envelope of

air, thus providing for the quick oxidation of the oil and also insuring each of the particles of the road surface being surrounded by a particle of oil, the envelope of air surrounding such particle of oil insuring the adhesion of the oil to the road surface particles.

The specification of the Ward patent states one of the objects

“is to expedite the conversion of the oil to a solid condition by increasing the state of division thereof and thereby correspondingly increasing the rapidity of oxidation. In the formation of an oiled road the gradual oxidation of the oil by the action of the air is an important feature in the conversion of the road surface to a hard resistant condition, and my invention provides for exposing the oil to the air in the most effective manner for such oxidation.” [Transcript page 56, column 1, lines 30-41.]

“The process consists essentially in applying the oil to the road surface in a condition of suspension in the air in such manner that the oil, as it settles into contact with the road surface, permeates the road surface by reason of its fine state of division, forming a coating over each solid particle in the road surface, so that in the stirring and compression of the road surface by the ordinary traffic these solid particles will be compacted together and will be caused to form a waterproof compact mass, the oil acting as a binder.” [Transcript page 56, lines 50-61.]

In the drawings of the Ward patent are shown an apparatus or machine by means of which the process

may be carried out or performed, and in Fig. 2 of the drawings is illustrated the comminution of the oil and its projection downward under pressure so that as the machine is moved forward air is brought into contact with the oil particles and thereby the oil is surrounded by an envelope of air, which both insures the quick oxidation of the oil and also insures the oil readily adhering to each particle of the road surface, the envelope of air overcoming the tendency of the particles of the road to repel the oil and effectively acting to cause the quick adherence of such roadway particles with the oil. This action might be likened, for illustration, to that of a magnet, the envelope of air so surrounding the oil causing the particles of the roadway to actually draw the oil to them, instead of repelling such particles, as would be the case if the proper amount of air were not commingled with the oil and projected into the roadway surface with the oil.

In compliance with section 4888 of the Revised Statutes, Mr. Ward in his patent has both described his process and the *best* mode or manner of performing the same. This "*preferred form*" of the invention or preferable manner of performing the process is set forth on page 56 of the Transcript, column 2, lines 105 *et seq.*, as follows:

"The process *may be* carried out as follows: The oil, which is preferably crude petroleum or residuum, of proper gravity and preferably with asphaltum base, is supplied in the tank 1 and being preferably subjected to a preliminary heating before being charged into said tank, so as to render the oil sufficiently fluid for atomization. The oil

tank and the truck being drawn over the surface of the roadway, the motor 14 is set in operation to drive the pump 8 and pump the oil from the oil tank 1 and pipes 11 and 10, through the delivery or outlet pipe 7 and distributor pipe 5. The atomizing nozzles 6 are opened by their handle means 20 more or less to supply oil according to the condition of the roadway, the amount of dust thereon, etc., so as to provide for a supply of oil commensurate with the absorbing capacity of the roadway, only so much being supplied as can be taken up by the dust and the porous surface of the roadway as a superficial film on each solid particle or surface without the formation of pools or visible masses of oil. In case an extra supply of oil is needed, the valves 6¹ are opened, distributing the oil as indicated in dotted lines in Fig. 2, in addition to the distribution by the nozzles 6. The oil is forced by the pump 8 through the atomizing nozzles under sufficient pressure to insure atomization, and the openings for the atomizing nozzles are sufficiently contracted to insure that as the oil issues under such pressure it will, on encountering the air, be broken up into such fine particles that it tends to remain suspended in the air for an appreciable length of time, forming a mist or mixture of air and minute particles of oil. This operation of finely dividing the oil to form a mixture with air is well understood under the term 'atomization,' and the function of the operation in my process is to render the oil capable of permeation or diffusion into and between the solid particles and surface of the roadway, the mixture of air and atomized oil having in this respect the properties of a gas as distinct from those of a liquid or solid."

Fig. 2 of the drawings of the Ward patent [Record page 54] shows the manner of delivery and discharge of the oil in accordance with Mr. Ward's process. The discharge nozzles or sprays 6 are directed directly downward toward the road surface. As the oil is discharged under pressure, i. e., forced by the pump 8, the oil is driven into the surface of the road. As clearly illustrated in Fig. 2 of the drawings, the oil issues from the nozzles 6 in a thin fan-shaped sheet. As the oil expands laterally from the nozzles, it must occupy more space than when contained within the pipes above the nozzles. In order to so occupy more space, the oil must expand, i. e., be divided up into particles. It is obvious that the amount of absolute separation, or the distance of the particles from each other, will depend in degree upon the distance of the discharge nozzles from the surface of the road; also in degree the question of time between the discharge and the forcible projection of the atomized oil in between the particles of the road surface will also depend upon the distance of the discharge nozzles above the road surface. As the apparatus or machine is being moved forward over the road surface all the time, it is obvious that the film or thin fan-shaped sheet of oil is furnished at all times with a large quantity of air so that each particle of oil is surrounded with air and each particle takes up air and carries such air with it into the road.

It is obvious that inasmuch as the thin sheet or film of oil is forcibly projected onto or against the surface of the road there can be no suspension of the oil in the air in the sense that it floats in the air. If

the particles of oil floated in the air, it could not be properly said that they were driven on to the road surface. As we shall see hereafter when referring to the abandoned experiment of Mr. Hatfield, it was found in actual use to be totally impractical to discharge the oil in a finely divided state out into the air and permit it to drop on to the road surface. Mr. Ward's conception was to force the oil against and into the particles of the road surface. But his conception went further than this,—it was to divide up the oil into an atomized or broken condition so that the particles of oil carried with them air, and it is in this sense, and this sense only, that the oil is suspended in the air by the Ward process.

Fig. 2 of the drawings of the Ward patent totally destroy any contention that Mr. Ward's conception was to permit the finely divided particles of oil to be "suspended" in the air in the sense that the oil particles floated on the air. Fig. 2 shows the forcible projection downward of the oil and the forcible projection downward of the oil under pressure prohibits any suspension of the oil in the air in this sense. A proper understanding of this feature of the Ward process is necessary to the proper construction of the Ward patent. Not only have we the showing of the drawings of the Ward patent to throw light upon the true meaning of the suspension of the oil particles in the air, but we have the testimony of both Mr. Ward and of Prof. Gilbert E. Bailey. Mr. Bailey has been in charge of the Department of Geology in the University of Southern California for some years. He is a man of wide

experience in chemical and geological work, and has given particular attention to the subject of organic and inorganic chemistry for four or five years. He has studied asphaltum oils and given considerable attention for a period of years to the use of asphaltum oils in road building. He has seen the Ward process in use by both Mr. Ward and the defendant company. His testimony in regard to this is found particularly on pages 20-22 of the Transcript of Record. He says that in the Ward process the oil is suspended in the air in two senses. Mr. Bailey testifies:

“The oil issuing from the nozzle passing vertically downward passes through ten to twelve inches of air. In that passage, in one sense, it is suspended in the air the same as any body moving in the air—a cannon ball or a bullet. The oil passing from the nozzles down interferes with the air in passing through it so that there is a tendency to cut the particles of the oil with air. Now, when the oil strikes the ground with the force given by the pump, it penetrates to a certain degree the dust or dirt of the surface and mixes with that dust, *and the air* that it carries down in that passage is held in those spaces, and to that extent is mixed or suspended with the air. In other words, the air when brought in contact with the particles of oil so that the oil absorbs it and operates to oxidize, the effect being that the film that is put on the road is thickened and hardened. In regard to the oxidation, I notice in going behind those machines and as shown in the photographs that you can see through the film. As it comes down it is transparent. Therefore it must be exceedingly thin at those transparent points, and the particles

in it must be of very narrow diameter. That film in coming down under pressure, *the very fact that they branch out in a fan shape, shows that they rebound—that is, there is a separation which would facilitate the mixing of the air with the oil,* and as the oil comes down vertically with force it is also moving forward, so that the downward rush would tend to create a vacuum down, in drawing air against this thin film; and as it moves forward the air comes in contact with it. The thinness of the film seemed to me in watching the machine, and its fan shape, and the force it came down with, seemed to be its peculiarities as distinguished from sprinkling or flowing from a spout, and so on.

“The breaking up of the oil into thin particles or sheets and the development thereof in the air brings a greater quantity of air in a lesser time in contact with the oil, increasing oxidation; as another illustration of an envelope of substance about crude oil is the common one of water and oil that we have so frequently at the oil wells. Water comes with the oil and the particles of oil fill with water and it is difficult to separate the two; such body of oil and water is similar to the body of oil and air as thus projected downward into the air by the process of this patent; the oil striking the ground with force and forced into the roadway surface has a tendency to carry the air down and hold it there, and when it is so held it is really quite difficult to separate it in any form.”

It is clear from the specification of the Ward patent that the term “suspended in the air” means that the particles of oil shall be suspended in air when pro-

jected in between the particles of the road surface so that the oxidation will be rapid and the natural tendency of the road particles to repel the oil overcome. This is made clear by reference to the Ward specification [Transcript page 57, column 2, line 43], where it is said:

“Where oil is deposited on the roadway by means of the ordinary sprinkling nozzles *or* by means of forcing the oil in a solid stream into violent contact with the surface of the roadway, the oil tends to collect in pools and has to be violently forced into the interstices of the roadway by mechanical action *for the reason that roadway surface dust particles, etc., have no capillary attraction for the oil but rather tend to repel the same* until they have been actually wetted with it, *but by reducing the oil to an atomized condition and suspending it in the air*, it is caused to enter the porous surface of the roadway and to penetrate between the dust particles by a process of diffusion.”

It is obvious that this portion of the specification cannot refer to suspending the oil in the air in the sense of the oil floating on the air, but refers to suspension or surrounding of the oil with the air while the oil and air are together in between the road surface particles. It is the oil and air that are “caused to enter the porous surface of the roadway.”

This interpretation of the meaning of the suspension of the oil in the air is also the only one which is consistent with the Ward specification [Transcript page 56, lines 50-54], where it is stated that:

“The process consists essentially in applying the oil to the road surface in a condition of suspension in the air,” etc.

To say that the oil is suspended in the air in the sense of floating thereon or therein and being suspended from the action of gravity by the air,—hence held from the ground, would prohibit such oil being applied “*to the road surface* in a condition of suspension in the air.” If the oil were suspended in the air in such sense it would not be applied *to the road surface*. If, however, this be interpreted in the chemical sense of suspension the meaning is clear and true and all the above references to the specification agree in meaning.

The interpretation thus placed upon this term “suspension” by Mr. Ward and by Prof. Bailey brings out the chemical action sought by Mr. Ward, i. e., the condition required for rapid *oxidation* of the oil and road material to form a “compact, dense and substantially uniform waterproof surface.” [Ward Patent Specification, Record page 57, lines 76-77.]

It is of course obvious that the process may be applied to its fullest utility or in part, depending upon the degree of atomization or comminution of the oil, due to the distance the delivery sprays are arranged above the road surface; the character or density of the oil; the degree of temperature of the oil; its fluidity, etc. But the essential with all other conditions is the chemical suspension of the oil in air so that the natural tendency of the earth matter to repel the oil is

eradicated and the oil will readily adhere to the particles of the road surface and rapid oxidation take place.

In this connection and in approaching the consideration of the claims of the Ward patent, it is necessary to bear in mind the well-settled principle of law that

“In a case of doubt, where the claim is fairly susceptible of two constructions, that one will be adopted which will reserve to the patentee the actual invention.”

McLain v. Ortmeier, 141 U. S. 425.

“The object of the patent law is to secure to inventors a monopoly of what they have actually invented or discovered, and it ought not to be defeated by a too strict and technical adherence to the letter of the statute or by the application of artificial rules of interpretation.”

Topliff v. Topliff, 145 U. S.

As will be seen from the evidence, Mr. Ward was the first to conceive of the process of atomizing oil in contact with the air in such manner that the oil tended to remain suspended or surrounded with a sufficient quantity of air to cause rapid oxidation, discharging such oil through the air directly downward upon the road surface and into the same, carrying with it the air, surrounding the oil particles, in sufficient quantity and intimacy to cause ready adhesion of the oil to the road particles, thereby overcoming the natural tendency of the road particles to repel the oil, and thereby depositing the oil upon each particle of

the roadway. The chemical suspension of the oil in a body of air and the forcible discharge of the oil in an atomized or broken up state directly downward onto the road surface and into the same, carrying with it the necessary air, are the essentials of Mr. Ward's discovery.

Mr. Ward introduced this process. It was first used in road building in Los Angeles county. After its use the specifications for road building were changed. The amount of oil required was cut down to less than one-half that theretofore required.

The defendant company was one of the first to use the Ward process and the road made thereby was the cause of this revolution in road making and in the use of oil in making roads. This is proven not alone by Mr. Ward's testimony but by the testimony of George A. Rogers, the treasurer and general manager of the defendant. [Transcript pages 30 and 31.] On cross-examination Mr. Rogers says that the Ward machine was the first pressure machine he ever used; that it was on the Valley boulevard in Los Angeles county; that the use of this Ward machine "was the cause of the adoption of that class of work in Los Angeles county"; that defendant continued to use this Ward machine from 1910 to 1912, "when somebody stole it."

The Ward process has come into general use. Its use has been licensed in New York, North Carolina, Texas, Oregon, British Columbia, California, etc. The testimony of Mr. Rogers, general manager of defendant, is the forcible tribute to Mr. Ward's genius,—to the value of Mr. Ward's discovery. "*Every one*

changed to pressure machines," says Mr. Rogers. This was by reason of Mr. Rogers' demonstration of the Ward process on the Valley boulevard in 1910.

The evidence shows that after using for approximately three years the Ward machine the defendant corporation equipped itself with other machines for making roadways by this process, such machines being manufactured in the East and being known as the "Monarch" machine. These machines were provided with a pump for discharging the oil under pressure and with atomizing nozzles. These nozzles were arranged in a row or series in staggered relation so that the film or sheet of broken oil from one nozzle overlapped that from another but did not project thereinto, the nozzles being arranged alternately in front or behind the next adjacent nozzles. These nozzles were provided with lips so that as the oil was forced into them and passed through them it was forced against these lips and through a narrow slot, this slot being about one-eighth of an inch wide and about seven-eighths of an inch long. The oil in these machines was heated. In many cases a temperature of about 300° was secured. This temperature was varied in accordance with the gravity of the oil used. In all essentials the defendant's machine was like the Ward machine. In fact, the only claimed difference is in the nozzles, and as to this there is practically no difference. It is the undisputed testimony that the oil was delivered from both the Ward and Monarch machines in a fan-shaped sheet. With the Monarch or defendant's machines this oil delivery was less than one-

eighth of an inch wide or thick and less than one inch long at the discharge slot of the nozzle. The testimony of the witnesses varies slightly as to the height at which the nozzles of the defendant's machines were kept when applying the oil. Some of the witnesses say that the defendant's nozzles were arranged from six to eight inches above the surface of the roadway,—others say eight to twelve inches above the roadway. All of the witnesses, however, agree that the film or sheet of oil delivered from the nozzles of defendant's machine was very thin. The best expression that they could give for this was "as thin as a sheet of paper." It can be readily understood that this was true, for all of the witnesses agree that after the oil issued through this slot less than one-eighth of an inch wide and less than one inch long, it can be expanded in an inverted fan-shaped film or sheet until such film or sheet was from six to twelve inches in length (crosswise of the road and in the direction of the length of the slot in the nozzle). It is obvious that if this oil expanded to this width the thickness of the sheet or stream must either have become extremely thin or the sheet must have become broken up or divided into particles.

Defendant's witness E. B. Gilmore [Transcript page 43] says that the appearance of the film of oil was just like a spray of water and that the atoms of the oil were spread out. This testimony agrees with the necessary mechanical facts which are capable of demonstration by any application of one of these nozzles to a garden hose. It is obvious that the further the

atomizing nozzle is from the surface of the ground the more broken up the atoms or thin sheet of water or oil will be when it strikes the ground.

As said by defendant's witness E. F. Godso, the assistant chief engineer of the Los Angeles county highways, when a light coat of oil is used the sheet or film is "almost transparent." It is a well-known fact that if you expand either water or oil to many times its volume it must either change its character or become separated into particles. It is not pretended that with defendant's nozzles there is any change in character, and it follows, therefore, that there must be more or less atomization.

Prof. Bailey says that he inspected the use of the defendant's machine on the Harbor boulevard in Los Angeles county Feb. 17, 1913, and observed that the oil came out of the nozzles in a thin triangular sheet or film; that by looking at it you get the same idea of it on the eyes as you do from the photograph [Complainant's Exhibit #2, Transcript page 59]. He states that the oil expanded out and broke into a spray; that this is the very object of the slot in the nozzle. Prof. Bailey says that he has examined Mr. Ward's machine in operation probably half a dozen times, and particularly to see the operation of the nozzles and the appearance of the oil; that from Mr. Ward's machine the oil issued from the nozzles in a fan-shaped form and formed a very thin film that was transparent. In comparing the two machines and the processes outlined thereby, Prof. Bailey says [Transcript page 22]:

"They were the same and the effect was the same;

they gave the same fan-shaped film and were forced down under pressure and produced the same effect on the road."

Mr. Ward testifies [Transcript page 15] that "with the defendant's machine the pressure forces the oil out in a fan-shaped spray directly downward; this spray is very thin; it is broken up and you can see through it in many places; it immediately covers every particle of the road surface and the pressure behind it shoots it into the voids at interstices of the road surface so that every particle is immediately covered. As the apparatus moves forward the air comes right up against this sheet; the fan-shaped sprays or sheets of oil draw the air down and intermingle the oil and air, causing the oil to oxidize much quicker and harden much quicker." Mr. Ward says on cross-examination that in observing the defendant's machine he particularly noticed that the oil came out in a thin fan-shaped sheet or film broken by pressure; it broke very close to the ground, possibly some of the sheets would break two or three inches from the ground and some of them would be closer to the ground; it separated into atoms and broke into small or big or large. Mr. Ward particularly says that the oil as discharged from defendant's machine did not separate into strings or streams of oil [Transcript page 18]. This is not denied. There is no witness who has testified that the defendant's machine delivered the oil on to the roadway *in a stream*. The testimony of Prof. Bailey and of Mr. Ward rings true when the mechanical factors are con-

sidered. The expansion of a body of oil one-eighth of an inch wide and less than one inch long to a sheet or film six inches long would render it impossible for such sheet to remain a solid sheet or stream of any thickness whatever. This expansion is six times its length, and if decreased in thickness or width to correspond would make the sheet less than one-forty-eighth of an inch. This would be an impossible condition and remain as a solid sheet. The testimony of defendant's witness, Mr. Gilmore, that the oil atoms spread out must therefore be correct.

It is shown in the evidence that with Mr. Ward's machine he uses about twenty pounds pressure upon the oil to force it through the atomizing nozzles. Defendants use about twenty-five to thirty pounds pressure with their machine [testimony of George A. Rogers, Transcript page 30]. Mr. Rogers says that defendants' nozzles are arranged six or eight inches above the ground. Whether there is an atomization or breaking up of the oil into particles with defendants' apparatus, therefore, can be demonstrated to a mathematical certainty. It is a well-known general fact that if a liquid is discharged under pressure from a small orifice, as soon as the retaining pressure of the conduit through which it has been passed by such force or pressure is removed, the liquid expands and breaks up. It no longer remains solid. This is what is meant by "atomization" in the sense of the Ward invention. With defendants' machine each of these atoms is surrounded by air. Whether surrounded by air to the

same degree as though the atomizing nozzles were raised ten, twelve or fourteen inches from the ground is immaterial. It is clear that no substantial change has been made by defendant in its later apparatus from the process as used by it in the machine furnished to it by Mr. Ward. Defendant secures its economy of oil through the process discovered by Mr. Ward and by him demonstrated to the defendant. It follows, therefore, that infringement is proven.

It is clear that the Hatfield experiment was abandoned and that it falls in that class of abandoned experiments which do not anticipate. *Parker v. Stebler*, 177 Fed. 210. The Hatfield machine was tried out once. The witnesses say that it was not satisfactory or successful. The work then under way was finished by other means and by the old drip process. Nothing more was ever heard of the Hatfield machine.

The proof in regard to the Tomer machine or process fails to measure up to the requirements called for by the law. No documentary evidence of any kind was submitted nor were any physical exhibits produced from which the court could ascertain to a certainty that the Tomer device was constructed to utilize the method or process of the patent in suit. The lower court was correct in paying no attention whatever to these two defenses.

In conclusion, therefore, appellant submits that it is clearly shown that the defendant, without the license of appellant, has used the process of appellant's patent

and particularly as set forth in claim 1 thereof. Defendant's machine or apparatus certainly divides up or atomizes the oil in contact with the air. The expansion of the sheet of oil from less than one inch long and less than one-eighth of an inch thick or wide to a film six to eight inches long or greater necessitates the breaking up or dividing up of the oil into particles or minute atoms. As the machine is moving along and the oil is thus forcibly driven down through the air, the air is thoroughly commingled therewith and the oil tends to remain suspended in such envelope of air for an appreciable time. It is not disputed that the atomized oil from the defendant's machine is brought into contact with a porous road surface, or that it is caused to permeate between the porous road surface or caused to be deposited on the material of the road surface. The manner of discharge under pressure and forcible contact of the commingled air and oil with the road surface insures such material (to-wit, the air and oil while in such agitated state or so "partly suspended"), insures or causes the atomized oil to be deposited on and between the particles of the road surface in identically the same manner as illustrated in Fig. 2 of the patent in suit.

Respectfully submitted,

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